Co-funded by the
Erasmus+ Programme
of the European Union

PASO (Precision Agriculture Service Office)

Erasmus+ Project
New and Innovative Curricula in Precision Agriculture / (NICOPA)
597985-EPP-1-2018-1-KZ-EPPKA2-CBHE-JP

PASO course syllabus

Precision Agriculture

Course hours: 100

Lecture: 20
Practice: 40
Independent work: 40

Instructor: I.Aslanov

Tashkent – 2021

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Module / Course Syllabus
Faculty of Land resources and cadastre
60722700- "Innovative technologies in remote sensing of the Earth"

Course:	Precision Agriculture
Course type :	Elective
Course code:	PA3104
Year :	4
Semester :	11
Form of education:	Daytime
Form of classe hours allocated to the semester:	100
Lecture	20
Practical training	40
Independent study	40
Credit amount:	4
Evaluation form:	Writing
Course language :	English

Course Objectives (CO)	
CO	"Precision Agriculture" is the formation of the ability to scientifically analyze of using new technologies in agriculture sector, and explanation and understanding problems precision agriculture and there situations, which are the main focus will be tecnology and softweres, application and modelingls.

Basic knowledge for mastering the course	
1	Geoinformatics, Agriculture, Remote sensing, Statistics

Learning outcomes (TO)	
	In terms of knowledge:
TO 1	Must have knowledge of general concepts of Precision Agriculture;

TO 2	Must have knowledge of precision agriculture g data;
TO 3	Must have knowledge of precision agriculture software;
TO 4	Must have knowledge of precision agriculture software processing ;
	In terms of skills:
TO 5	Satllate images and knows information about the precision agriculture data;
TO 6	GIS software and image processing to use in Agriculture;
TO 7	Sensors and remote sensing on precision agriculture
TO 8	Classification of recycling and data processing models

Course content	
Form of training: Lecture (L)	
L1	A History of Precision Agriculture
L2	Sensing Technology for Precision Crop Farming
L3	Data Processing and Utilization in Precision Agriculture
L4	Control of Precision Agriculture Production
L5	Precision Agriculture in Large-Scale Mechanized Farming
L6	A Systems Approach to Community-Based Precision Agriculture
L7	Precision Agriculture – From Mapping to SiteSpecific Application
L8	Smart Farming Technology Types
L9	How to Model the Adoption and Perception of Precision Agriculture Technologies
L10	Future Perspectives of Farm Management Information Systems
Form of training: Practical training (PT)	
PT1	Sensing Technology for Precision Agriculture
PT2	Data Analysis and Evaluation Technologies
PT3	Application Technologies of controlling productions
PT4	Remote sensing Sensors for Precision Agriculture
PT5	Yield Sensors (On the go sensors)
PT6	Crop Sensors, Optical Sensors, Product Sensors
PT7	GIS Technologies in Precision Agriculture
PT8	Sustainable Intensification in Crop Farming and Yield Monitoring Technology and Operation
PT9	Smart Farming Technology Types, Equipment for Variable Rate Application
PT10	Precision Irrigation and Irrigation Scheduling Technology
PT11	Model the Adoption and Perception of Precision Agriculture Technologies
PT12	Normalized Difference Vegetation Index (NDVI) using field analysing
PT13	Yield Mapping
PT14	The Economics and Perspectives of Site Specific Irrigation Management
PT15	Machines sensors and Their Properties
PT16	Farm Management Information Systems Functionalities and Applications
PT17	Sustainable Agriculture and Environmental Impact
PT18	Economic Analysis and Decision Support Systems using GIS models
PT19	Factors influencing the adoption of precision agriculture technologies by farmers
PT20	Machine learning algorithms for predicting crop yields, pest outbreaks, and optimal management practices

Form of training: Independent study (IS)

IS1	Study of developing Precision Agriculture Around the World
IS2	Use of satellite imagery, aerial photography, and drones for crop

	monitoring and management
IS3	Geographic Information Systems (GIS) for spatial analysis and decision-making in agriculture.
IS4	Big data analytics for processing and interpreting large volumes of agricultural data
IS5	Use of sensors and monitoring systems for animal health, behavior, and production
IS6	Automated feeding systems and environmental control in livestock facilities
IS7	Precision agriculture techniques for minimizing environmental impact, such as reducing chemical usage and soil erosion
IS8	Integration of precision agriculture with conservation practices like cover cropping and crop rotation
IS9	Decision support systems (DSS) for recommending optimal management strategies based on economic and agronomic considerations
IS10	Policy implications and regulations related to the use of technology in agriculture, including data privacy and security concerns

The learning rate of the student in the subject "Precision Agriculture" during the semester is distributed as follows			
Maximum rating	Qualifying score	By types of control	
		Mid exam	Final exam
5	3	3	5

Subjects were accepted according to the assessment criteria		
Grade	**Grade**	**The level of knowledge of students**
5	A	Conclusion and decision making. Ability to think creatively. Ability to conduct independent observation. Ability to apply acquired knowledge in practice. Explain the essence. To know, to tell. Have an imagination.
4	B	Independent observation. Ability to apply acquired knowledge in practice. Explain the essence. To know, to tell. Have an imagination.
3	C	Explain the essence. Knowing, telling, imagining.
2	D	Not having a clear vision. Not knowing

Basic literature	
1	S. Lavender and A. Lavender, Practical Handbook of Remote Sensing. CRC Press, 2015.
2	L. J. Guo and P. J. Mason, Image processing and GIS for remote Sensing. John Wiley & Sons, Ltd., 2016.
3	I.M. Aslanov Masofadan zondlash. Toshkent, TIIAME NRU, 2022.

Recommended additional reading	
1	Soren M.P., Kim M.L. 2017. Progress in Precision Agriculture. Springer Publications. Switzerland
2	Qin Zhang.2016. “Precision agriculture technology for crop farming”, CRC Press Washington, USA.
3	J. Stafford, A. Werner. 2003. Precision Agriculture-Wageningen Academic Publishers, Holland.
4	https://www.tiiame.uz/en/

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